

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
4 August 2005 (04.08.2005)

PCT

(10) International Publication Number
WO 2005/071704 A3(51) International Patent Classification⁷: **H01G 9/20**,
H01L 31/04, 31/18(21) International Application Number:
PCT/JP2005/001180

(22) International Filing Date: 21 January 2005 (21.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-014971 22 January 2004 (22.01.2004) JP
2004-014987 22 January 2004 (22.01.2004) JP
60/541,504 4 February 2004 (04.02.2004) US
60/541,503 4 February 2004 (04.02.2004) US
2004-342808 26 November 2004 (26.11.2004) JP(71) Applicant (for all designated States except US): **SHOWA DENKO K.K.** [JP/JP]; 13-9, Shibadaimon 1-chome, Minato-ku, Tokyo 1058518 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KAYAMA, Susumu** [JP/JP]; c/o Showa Titanium Co. Ltd., 3-1, Nishinomiya-machi, Toyama-shi, Toyama 9318577 (JP). **WAKIZAKA, Yasuaki** [JP/JP]; c/o Showa Titanium Co. Ltd., 3-1, Nishinomiya-machi, Toyama-shi, Toyama 9318577 (JP). **KONDO, Kunio** [JP/JP]; c/o Corporate R & D Center, Showa Denko K.K., 1-1, Ohnodai 1-chome, Midori-ku, Chiba-shi, Chiba 2670056 (JP).(74) Agents: **AOKI, Atsushi** et al.; A. Aoki, Ishida & Associates, Toranomon 37 Mori Bldg, 5-1, Toranomon 3-chome, Minato-ku, Tokyo 1058423 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
23 February 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METAL OXIDE DISPERSION, METAL OXIDE ELECTRODE FILM, AND DYE SENSITIZED SOLAR CELL

(57) Abstract: A metal oxide dispersion comprising metal oxide particles with a necking structure, and a solvent, wherein the liquid droplet contact angle of the metal oxide dispersion to an ITO film (Indium-Tin Oxide type film) formed is from 0 to 60°. A metal oxide dispersion for the production of a dye-sensitized solar cell electrode, comprising Metal Oxide Particle Group F having a necking structure formed by m connected particles, Metal Oxide Particle Group G having only 0.2m or less connected particles, and a solvent, and being formable into a film at 200°C or less. A metal oxide electrode comprising an electrically conducting substrate having thereon a metal oxide layer comprising metal oxide particles bound by a binder, wherein the binder content is from 0.005 to 5 mass% based on the metal oxide film and the metal oxide layer has a pencil scratch strength of H or more according to JIS5600.

WO 2005/071704 A3